

BSc (Hons) Biotechnology – A325

1. Objectives

Biotechnology originates in the 1950's, when the secret of life, DNA was disclosed by two UK researchers, Watson and Crick. The term is now described as a multi-disciplinary science covering a range of disciplines including molecular biology, genetics, biochemistry, analytical chemistry and bioprocess engineering. People's lives have been influenced by biotechnology for centuries as a result of the use of microorganisms to produce food and drinks. The production of antibiotics by the large-scale fermentation of microorganisms in the pharmaceutical industry has revolutionized healthcare. Biotechnological methods are now being applied to provide solutions to various problems such as the use of novel drugs for the cure of cancer, AIDS and other diseases and can also be exploited to provide environment friendly solutions to very difficult problems such as the microbial digestion of wastes for the production of biogas. Biotechnology has also a crucial role to play with respect to food security issues through the use of cell and tissue culture technology for rapid propagation of plants and techniques of molecular diagnosis.

This programme is designed to provide students with grounding in the various disciplines mentioned highlighting the recent possibilities for medical, pharmaceutical and agricultural applications while considering the ethical issues.

Upon successful completion of this programme, learners will be able to:

- Demonstrate a broad understanding of the concepts and applications of biotechnology;
- Apply their knowledge of biotechnology to solve various problematic issues;
- Communicate effectively the information and arguments while showing critical analytical skills;
- Use a range of techniques to initiate and undertake the analysis of data and information;
- Show practical competencies and techniques in molecular biology and biotechnology;
- Depict the uncertainty, ambiguity and limitations of knowledge in biotechnology;
- Describe and comment on particular aspects of recent trends in biotechnology;
- Apply their knowledge and understanding in order to initiate and carry out an extended piece of work or project.

2. General Entry Requirements

In accordance with General Entry Requirements for Admission to the University for Undergraduate Degrees.

3. Programme Requirements

SC : Credit in Mathematics, Biology and Chemistry

2 GCE 'A' Levels passes in Food Science, Biology, Chemistry, Mathematics or Physics.

4. Programme Duration

	Normal (Years)	Maximum (Years)
Degree	3	5

5. Credits per Year: Minimum 18 credits, Maximum 48 credits subject to Regulation 4.

6. Minimum Credits Required for Award of Undergraduate Degree: 103

Breakdown as follows:

	Credits from	
	Core Taught Modules	Project
Degree	94	9

The module Practical Training – AGRI 2000 and the module Scientific Communication – AGRI 2100 must be completed satisfactorily for the award of the degree.

Students may exit with a:

- Certificate after having earned 30 credits in core modules.
- Diploma after having earned 60 credits in core modules.

7. Assessment

Each module will be assessed over 100 marks (i.e. expressed as %) with details as follows (unless otherwise specified).

Assessment will be based on a Written Examination of 2-3 hour duration, carrying a weighting of 70%, and Continuous Assessment carrying 30% of total marks for AGRI modules. Modules from other Faculties/Departments/Centres will carry weighting in the Written Examination and the Continuous Assessment as specified by the Faculties/Departments/Centres concerned. Continuous Assessment will be based on laboratory/field works, and/or assignments, and should include at least 1 class test.

An overall total of 40% for combined continuous assessment and written examination components would be required to pass the module, without minimum thresholds within the individual continuous assessment and written examination.

Modules will carry the weightings of 1, 3 or 5 depending on their status (Introductory, Intermediate or Advanced). Weighting for a particular module is indicated within parentheses in the module code.

Each module will carry credits in the range of 3 to 6. Project – AGRI 3000Y(5) will carry 9 credits.

Assessment of the module AGRI 2100 - Scientific Communication will be based on continuous assessment of students throughout the module and/or submission of a portfolio. The module carries no credits. For satisfactory completion of the module, a minimum of 40% should be attained.

Assessment of practical training will be based on the on-site supervisor's evaluation and the student's portfolio. For satisfactory completion of the practical training, a minimum of 40% should be attained.

Written examinations for all AGRI modules will be carried out at the end of the academic year.

Submission Deadlines for Dissertation:

- First Draft: by last week day of February of the Academic Year.
- Final Copy: three copies of the dissertation (2 spiral-bound copies and 1 copy on electronic storage media) by last week day of March of the Academic Year by 4.00 p.m at latest.

8. Academic Teaching in Case of an Emergency

To ensure minimal disruption of normal academic teaching in case of an emergency (eg. closure of the University for more than 2 weeks), the Moodle e-Learning Platform of VCILT will be used to deliver Teaching and Learning content. Relevant learning resources will be posted on the Platform. Assignments (if any) will be submitted using the online submission box. Arrangements will be made to register students on the Moodle platform at the beginning of the academic year.

9. List of Modules

CORE MODULES

<u>Code</u>	<u>Module Name</u>	<u>Hr / Yr</u>	<u>Credits</u>
		<u>L+P</u>	
AGRI 1046Y(1)	Chemistry Fundamentals and Biochemistry	60+60	6
AGRI 1047Y(1)	Microbiology and Genetics	60+60	6
AGRI 1048Y(1)	Cell Biology and Biotechnology	60+60	6
AGRI 1049Y(1)	Plant and Animal Science	60+60	6
AGRI 1077Y(1)	Biotechniques	30+30	3
AGRI 1056Y(1)	Introductory Statistics	30+30	3
AGRI 2081Y(3)	Statistical Methods and Computational Biology	60+60	6
AGRI 2064Y(3)	Biochemistry II and Human Physiology	60+60	6
AGRI 2085Y(3)	Molecular Biology and Biotechniques	60+60	6
AGRI 2009Y(3)	Cell and Tissue Culture	60+60	6
AGRI 2066Y(3)	Immunology and Molecular Pathology	60+60	6
AGRI 2067Y(3)	Industrial and Environmental Biotechnology	60+45	5
AGRI 2000	Practical Training	-	-
AGRI 2100	Scientific Communication	20+0	-
AGRI 3000Y(5)	Project	-	9
AGRI 3005Y(5)	GMOs, Biosafety and Bioethics	60+60	6
AGRI 3065Y(5)	Genomics and Proteomics	60+60	6
AGRI 3066Y(5)	Plant Biotechnology	60+60	6
AGRI 3067Y(5)	Biotechnology for Medical and Veterinary Applications	60+60	6
AGRI 3068Y(5)	Bioinformatics	45+60	5
Total Number of Credits = 103			

AGRI 2000 - Practical Training can be done in either Year 1 or Year 2.

AGRI 2100 - Scientific Communication will be done in Semester 2 in Year 2.

10. Programme Plan - BSc (Hons) Biotechnology

YEAR 1

CORE MODULES

<u>Code</u>	<u>Module Name</u>	<u>Hr / Yr</u>	<u>Credits</u>
		<u>L+P</u>	
AGRI 1046Y(1)	Chemistry Fundamentals and Biochemistry	60+60	6
AGRI 1047Y(1)	Microbiology and Genetics	60+60	6
AGRI 1048Y(1)	Cell Biology and Biotechnology	60+60	6
AGRI 1049Y(1)	Plant and Animal Science	60+60	6
AGRI 1077Y(1)	Biotechniques	30+30	3
AGRI 1056Y(1)	Introductory Statistics	30+30	3

YEAR 2**CORE MODULES**

<u>Code</u>	<u>Module Name</u>	<u>Hr / Yr</u>	<u>Credits</u>
		<u>L+P</u>	
AGRI 2081Y(3)	Statistical Methods and Computational Biology	60+60	6
AGRI 2064Y(3)	Biochemistry II and Human Physiology	60+60	6
AGRI 2085Y(3)	Molecular Biology and Biotechniques	60+60	6
AGRI 2009Y(3)	Cell and Tissue Culture	60+60	6
AGRI 2066Y(3)	Immunology and Molecular Pathology	60+60	6
AGRI 2067Y(3)	Industrial and Environmental Biotechnology	60+45	5
AGRI 2000	Practical Training	-	-
AGRI 2100	Scientific Communication	20+0	-

AGRI 2000 - Practical Training can be done in either Year 1 or Year 2.

AGRI 2100 - Scientific Communication will be done in Semester 2 in Year 2.

YEAR 3**CORE MODULES**

<u>Code</u>	<u>Module Name</u>	<u>Hr / Yr</u>	<u>Credits</u>
		<u>L+P</u>	
AGRI 3000Y(5)	Project	-	9
AGRI 3005Y(5)	GMOs, Biosafety and Bioethics	60+60	6
AGRI 3065Y(5)	Genomics and Proteomics	60+60	6
AGRI 3066Y(5)	Plant Biotechnology	60+60	6
AGRI 3067Y(5)	Biotechnology for Medical and Veterinary Applications	60+60	6
AGRI 3068Y(5)	Bioinformatics	45+60	5

Total Number of Credits = 103